

REMARKS

2. Claim 17 is objected to for informalities. Applicants have amended claim 17 to include "stationary" before "slave units". Applicants, therefore, respectfully request the objection be withdrawn and claim 17 be passed onto allowance.

3. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Specifically, the aforesaid claims are rejected because the term "the identification tag's (100) calculating unit" allegedly lacks proper antecedent basis.

Applicants have amended claim 1 to establish proper antecedent basis for the identified term. Applicants, therefore, respectfully request the rejection be withdrawn and claims 5 and 6 be passed onto allowance.

5. Claims 1, 3 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,528,232 (hereinafter "Verma"). Applicant respectfully disagrees with the Examiner's characterization of Verma and the rejections based thereon. The classic test for anticipation, under 35 U.S.C. §102, requires that every limitation in a claim must be present in a single source reference for that reference to "anticipate" the claimed invention.

Amended claim 1 recites an identification tag that comprises: 1) an ultrasonic transducer connected to a receiver adapted to receive ultrasonic signals, together with a radio transmitter connected to an antenna adapted to transmit an identity radio signal with information containing the identity of the identification tag; and 2) a calculating unit connected to a control unit arranged to calculate transit time differences for the received ultrasonic pulses.

Verma discloses tags that determine their range from a locator unit by: 1) measuring the transit time of an ultrasonic acoustic signal launched from the locator and received at the tag; 2) launching a time-coincident radio signal; and 3) determining the difference between the radio signal transit time and the ultrasonic acoustic signal transit time, knowing the speed of sound. (Col. 5, lines 9-15) Verma, therefore, determines range by comparing radio signals and ultrasonic acoustic signals. Consequently, it can be seen that Verma does not disclose an identification

tag that includes "a calculating unit ... arranged to calculate transit time difference" for received ultrasonic pulses.

For at least these reasons, applicants respectfully submit that claims 1, 3 and 7 are not anticipated by Verma, and ask that the aforesaid rejections be withdrawn, and that claims 1, 3 and 7 be passed to issuance.

6. Claims 1-4 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,141,293 (hereinafter "Amorai"). Applicant respectfully disagrees with the Examiner's characterization of Amorai and the rejections based thereon. The classic test for anticipation, under 35 U.S.C. §102, requires that every limitation in a claim must be present in a single source reference for that reference to "anticipate" the claimed invention.

There is no disclosure within Amorai of an identification tag comprising a calculating unit connected to a control unit arranged to calculate transit time differences for received ultrasonic pulses, as is recited in claim 1. The disclosure referred to in the rejection (col. 7, lines 58-60) does not state that the transmitting unit comprises a calculating unit. The teaching that ultrasound waves may be "analyzed at the object" is ambiguous and should be interpreted without hindsight. It could, for example, refer to an analogue-to-digital conversion step, or a Fourier frequency analysis, for example. In short, Amorai does not disclose an identification tag "arranged to calculate transit time differences for the received ultrasonic pulses".

The use of transit time differences, rather than absolute transit times, confers several advantages. For example, in embodiments of the invention this allows for a reduced memory on the tag since fewer time measurements are required and each is likely to be smaller. Such an arrangement could allow a higher positioning update rate to be used, since timing for a particular update operation does not commence until a first ultrasound signal is received, whereas in Verma timing is necessary from the (much earlier) receipt of the radio synchronisation message. Using transit time differences also avoids the necessity for synchronisation between the tag and the transmitter base(s). On this last point, the arrangement of Amorai requires that "a control unit initiates a position determining cycle by transmitting a radio frequency (RF) signal, which is received substantially simultaneously by the background units and the transmitting units" (col. 3, lines 15-18). Such initiation is not essential in accordance with the present invention.

For at least these reasons, applicants respectfully submit that claims 1-3 and 7 are not anticipated by Amorai, and ask that the aforesaid rejections be withdrawn, and that claims 1-3 and 7 be passed to issuance.

8. Claims 5, 6 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Amorai in combination with U.S. Patent 5,245,317 (hereinafter "Chidley").

Applicant respectfully directs the Examiner to the remarks above regarding Amorai.

Chidley discloses an article theft detection apparatus that includes an ultrasonic transmitter and transducers for saturating an area with ultrasonic signals, and security tags attachable to objects such as clothing. The security tags each include a receiver and an alarm. If the security tags are moved beyond the saturated area and are therefore unable to detect the ultrasonic signal, then the alarm will produce an audible sound. The security tags may also produce an audible signal if they are tampered with. (Col. 3, lines 9-25)

Applicant respectfully submits that the addition of Chidley does not overcome the shortcomings of Amorai; namely, neither reference discloses or suggests an identification tag "arranged to calculate transit time differences for the received ultrasonic pulses". Consequently, applicant respectfully submits that the identification tag of claims 5 and 6 is not obvious in view of the combined teachings of Amorai and Chidley.

Regarding the system of claim 8, as indicated above the combined teachings of Amorai and Chidley do not disclose or suggest an identification tag as recited in claim 1 for transmitting the identification tag's identity, as well as measuring transit time differences for received ultrasonic pulses, together with any additional information.

For at least these reasons, applicants respectfully submit that claims 5, 6, and 8 are not obvious in view of the combined teachings of Amorai and Chidley, and ask that the aforesaid rejections be withdrawn, and that claims 5, 6, and 8 be passed to issuance.

9. Claims 9-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Amorai in combination with Chidley and further in combination with GB Patent 2298098 (hereinafter "Vincent").

Claims 9-18 depend directly or indirectly from claim 8. Applicant respectfully directs the Examiner, therefore, to the comments above regarding the combined teachings of Amorai and Chidley with respect to claim 8. Applicant respectfully submits that none of Amorai, Chidley or Vincent disclose or suggest an identification tag alone or in a system, which tag is "arranged to calculate transit time differences for the received ultrasonic pulses".

For at least these reasons, applicants respectfully submit that claims 9-18 are not obvious in view of the combined teachings of Amorai, Chidley, and Vincent, and ask that the aforesaid rejections be withdrawn, and that claims 9-18 be passed to issuance.

10. Claims 19-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for this provisional allowance. Claim 19 has been amended into independent form. Applicant therefore respectfully requests that this objection be withdrawn and claims 19-25 be passed onto allowance.

As applicant has traversed the objections and rejections raised by the Examiner, it is respectfully requested that the Examiner withdraw the stated rejections, allow claims 1-3 and 5-25, and new claims 26-29, and pass the present application on to issuance.

Please charge our Deposit Account No. 50-3381 for the one-month extension of time fee and additional claim fees, as well as any additional fee that may be due in the present application.

Respectfully submitted,

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